

REMARKS

Claim 1 has been amended to incorporate the subject matter of claim 2 and claim 5. Claims 2, 4 and 5 have been canceled. Claims 14-20 were previously canceled. Claims 1, 3 and 6-13 are currently pending in this application. Applicants reserve the right to pursue the original and other claims in this and other applications. Applicants respectfully request reconsideration in light of the above amendments and the following remarks.

Description of the Claimed Invention:

The claimed invention relates to an optical information recording medium (CD-RW) that can undergo direct overwriting at high speeds and has sufficient storage reliability. Claim 1, as amended, recites an "optical information recording medium" comprising a "transparent substrate," a "recording layer disposed on the transparent substrate," and a "reflective layer disposed on the recording layer." Claim 1 also requires that "the optical information recording medium [be] capable of performing, at a linear recording velocity of 28.8 m/s to 33.6 m/s, at least one of recording, erasing and rewriting information by irradiating and scanning with focused light to thereby form and erase recording marks on the recording layer." Additionally, "the recording layer comprises at least one of alloys and intermetallic compounds each mainly comprising Ga, Ge, Sb, and Te in a compositional ratio represented by the following formula: $Ga_xGe_y(Sb_zTe_{1-z})_{1-x-y}$ wherein x, y and z each represent an atomic ratio of a positive real number less than 1 and satisfy the following conditions: $0.02 \leq x \leq 0.06$, $0.01 \leq y \leq 0.06$, $0.815 \leq z \leq 0.86$, $x \geq y$, $x+y \leq 0.1$." The "at least one of alloys and intermetallic compounds each mainly comprising Ga, Ge, Sb, and Te further comprises Mn in an atomic ratio 0.01 to 0.04."

The base material for the recording layer is an eutectic composition of SbTe of the formula $\text{Sb}_z\text{Te}_{1-z}$ where the ratio z is preferably 0.815 in order to achieve direct overwriting at a speed of 28.8 m/s to 33.6 m/s. Specification, ¶[0037]. The ratio z must also not exceed 0.86 in order to ensure a storage life of 1000 hours or more at 70° C. Specification, ¶[0037]. The recording layer of the invention includes Ga in order to concurrently yield recording at a high speed and easy initialization. Specification, ¶[0041]. The recording layer of the invention includes Ge in order to increase the temperature-dependency of crystallization. Specification, ¶[0042]. This allows the recording medium to have excellent erasing properties at high speed, namely excellent overwriting properties and high stability of recorded marks. Specification, ¶[0042]. The addition of Mn, at an atomic ratio of, most preferably, 0.01 to 0.04, increases the crystallization rate and decreases the crystallization temperature to thereby improve the direct overwriting properties at high speed and to facilitate the initialization. Specification, ¶[0044].

Rejections Under 35 U.S.C. §§ 102 and 103:

Claims 1-13 stand rejected under 35 U.S.C. §§ 102 and 103 over several prior art references. Each rejection and reference is addressed individually below, however Applicants respectfully submit that, overall, the cited references do not disclose, teach or suggest an optical information recording medium containing a recording layer of the composition recited in amended claim 1.

Claims 1-9 and 12-13 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Harigaya et al. (U.S. Patent Application Pub. No. 2002/0098445) ("Harigaya '445"). This rejection is respectfully traversed and reconsideration is respectfully requested.

Harigaya '445 discloses a phase-change optical recording medium with a recording material including Ge, Ga, Sb, Te and one of Mg and Ca. Harigaya '445, Abstract. Harigaya '445 does not disclose a phase-change optical recording medium with a recording material including Ge, Ga, Sb, Te and Mn. Accordingly, for at least this reason, claim 1 is allowable over Harigaya '445. Claims 3, 6-9 and 12-13 depend from claim 1 and are allowable along with claim 1. Applicants respectfully request that the rejection be withdrawn and the claims allowed.

Claims 1-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Harigaya '445. This rejection is respectfully traversed and reconsideration is respectfully requested.

The claimed invention also would not be obvious in view of Harigaya '445. A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. MPEP § 2141.02(VI). Harigaya '445 states that "when neither Mg nor Ca is contained [in the recording layer], recording at the higher recording velocity cannot be carried out," thus teaching away from a recording layer using Mn instead of Mg or Ca. Harigaya '445, ¶[0038]. Further, Harigaya '445 gives no indication of the benefit of using Mn in the recording layer. Thus, a recording layer of the claimed composition would not be obvious in view of Harigaya '445. Accordingly, for at least this reason, claim 1 is not obvious in view of Harigaya '445. Claims 3 and 6-13 depend from claim 1 and are allowable along with claim 1. Applicants respectfully request that the rejection be withdrawn and the claims allowed.

Claims 1-9 and 12-13 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Harigaya et al. (U.S. Patent No. 6,770,346) ("Harigaya '346"). This rejection is respectfully traversed and reconsideration is respectfully requested.

Harigaya '346 discloses several variations of recording layers including Ga, Ge, Sb, Te and Mn. Harigaya '346, Examples 4-9 and 19-26. However, as shown in the table below, none of these examples includes a combination of the materials that satisfies the requirements of the claimed composition.

Example #:	Atomic Percentage					Compositional Ratio				
	Ga	Ge	Sb	Te	Mn	Ga (x)	Ge (y)	Sb (z)	Te	Mn (w)
19	4	4	71	17	4	0.0417	0.0417	0.8068	0.1932	0.0400
20	3	3	73	15	6	0.0319	0.0319	0.8295	0.1705	0.0600
21	4	3	70	18	5	0.0421	0.0316	0.7955	0.2045	0.0500
22	2	2	72	16	8	0.0217	0.0217	0.8182	0.1818	0.0800
23	3	5	76	14	2	0.0306	0.0510	0.8444	0.1556	0.0200
24	4	2	70	20	4	0.0417	0.0208	0.7778	0.2222	0.0400
25	2	3	76	14	5	0.0211	0.0316	0.8444	0.1556	0.0500
26	5	1	66	22	6	0.0532	0.0106	0.7500	0.2500	0.0600
4 through 6	3	3	70.5	19.5	4	0.0313	0.0313	0.7833	0.2167	0.0400
7 through 9	2	5	69	18	6	0.0213	0.0532	0.7931	0.2069	0.0600

Accordingly, for at least this reason, claim 1 is allowable over Harigaya '346. Claims 3, 6-9, 12 and 13 depend from claim 1 and are allowable along with claim 1. Applicants respectfully request that the rejection be withdrawn and the claims allowed.

Claims 1-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Harigaya '346. This rejection is respectfully traversed and reconsideration is respectfully requested.

The Harigaya '346 patent shares a common assignee with the present application. The Harigaya '346 patent only qualifies as 102(e) prior art. Pursuant to 35 U.S.C. § 103(c), the Harigaya '346 patent cannot properly be cited in a rejection under 35 U.S.C. § 103(a) in the present application as the Harigaya '346 patent and the present application are commonly owned by the same assignee and the Harigaya '346 patent only qualifies as prior art under 35 U.S.C. § 102(e)/103(a). A Statement Concerning Common Ownership, as required under MPEP § 706.02(l)(2), is included below.

Statement Concerning Common Ownership

Applicants undersigned attorneys state that both the present application and the Harigaya '346 patent were, at the time the invention was made, subject to an obligation of assignment to the same person, namely, Ricoh Company, Ltd.

Accordingly, for at least this reason, claims 1, 3, 6-8 and 10-13 cannot be obvious in view of Harigaya '346. Applicants respectfully request the rejection be withdrawn and the claims allowed.

Claims 1, 3, 4, 6-8, 12 and 13 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Harigai et al. (JP 2003-246140) ("Harigai"). This rejection is respectfully traversed and reconsideration is respectfully requested.

Harigai discloses an optical recording medium with a recording material including Ge, Ga, Sb, Te and Sn. Harigai, Table 1, Example 8. Harigai does not disclose, however, the addition of Mn at an atomic ratio of 0.01 to 0.04. Accordingly, for at least this reason, claim 1 is allowable over Harigai. Claims 3, 4, 6-8, 12 and 13 depend from claim 1 and are allowable along with claim 1. Applicants respectfully request that the rejection be withdrawn and the claims allowed.

Claims 1-3, 6-8, 12 and 13 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Muira et al. (JP 2002-331758) ("Muira"). This rejection is respectfully traversed and reconsideration is respectfully requested.

Muira discloses an optical recording medium with a recording material including Ge, Ga, Sb, Te and In. Muira ¶[0031]. Muira does not disclose, however, the addition of Mn at an atomic ratio of 0.01 to 0.04 or a composition of Sb resulting in a z ratio of between 0.815 and 0.86. Accordingly, for at least this reason, claim 1 is allowable over Muira. Claims 3, 6-8, 12 and 13 depend from claim 1 and are allowable

along with claim 1. Applicants respectfully request that the rejection be withdrawn and the claims allowed.

Claims 1-3, 6-8, 12 and 13 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Suzuki et al. (JP 2002-347349) ("Suzuki JP 2002-347349"). This rejection is respectfully traversed and reconsideration is respectfully requested.

Suzuki JP 2002-347349 discloses an optical recording medium with a recording material including Ge, Ga, Sb and Te. Suzuki JP 2002-347349 ¶[00058]. Suzuki JP 2002-347349 does not disclose, however, the addition of Mn at an atomic ratio of 0.01 to 0.04. Accordingly, for at least this reason, claim 1 is allowable over Suzuki JP 2002-347349. Claims 3, 6-8, 12 and 13 depend from claim 1 and are allowable along with claim 1. Applicants respectfully request the rejection be withdrawn and the claims allowed.

Claims 1-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Harigaya '445, in view of Kunitomo et al. (U.S. Patent Application Pub. No. 2001/0003641) ("Kunitomo '641") and Takahashi et al. (U.S. Patent No. 6,153,355) ("Takahashi '355"). This rejection is respectfully traversed and reconsideration is respectfully requested.

For at least the reasons stated above, the claimed invention would not be obvious in view of Harigaya '445. Kunitomo '641 is relied upon to disclose GeSbTe recording layers with Ga, Sn, Ag and Se as additives. Office Action, page 7. Kunitomi '641 is also relied upon to disclose the use of reflective layers of up to 1000 nm. Id. Takahashi '355 is relied upon to disclose GeSbTe recording layers with Mn, Sn and Ag as additives in amounts of less than 5%. Id. These references, alone or in combination, do not disclose, teach or suggest a recording medium of the claimed composition.

Accordingly, claim 1 is not obvious in view of the cited combination of references.

Claims 3 and 6-13 depend from claim 1 and are allowable along with claim 1.

Applicants respectfully request that the rejection be withdrawn and the claims allowed.

Rejections for Non-Statutory Double Patenting

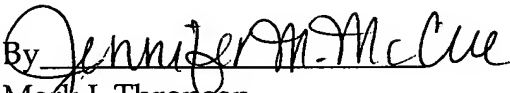
Claims 1-4, 6-8 and 10-13 stand rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of Harigaya et al. (U.S. Patent No. 6,790,592) ("Harigaya '592"). Claims 1-8 and 10-13 stand rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of Harigaya '346. Claims 1-4, 6-8 and 10-13 stand provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-8 of copending Application No. 11/130568, Kibe et al. (U.S. Patent Application Pub. No. 2005/0254410) ("Kibe '410"). Reconsideration is respectfully requested.

Attached hereto are resubmitted Terminal Disclaimers referring to U.S. Patent No. 6,790,592, U.S. Patent No. 6,770,346, and U.S. Application No. 11/130568. The terminal disclaimers are executed by an attorney of record in the oath. The nonstatutory obviousness-type double patenting rejections should be withdrawn. Payment of the \$390.00 statutory disclaimer fees was previously paid with Applicants' submission dated September 22, 2006. No fee is believed to be due, however the Director is hereby authorized to charge Deposit Account No. 04-1073 for any additional fees required to effect the proper filing of this communication, under Order No. H6790.0004/P004.

In view of the above amendment, Applicants believe the pending application is in condition for allowance.

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